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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/021,743	12/12/2001	Michael Halle	ZOG-009	5619

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EXAMINER

ALLEN, DENISE S

ART UNIT	PAPER NUMBER
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2872

DATE MAILED: 03/13/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/021,743

Applicant(s)

HALLE ET AL.

Examiner

Denise S Allen

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-23 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-23 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 12 December 2001 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 4,5.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: .

DETAILED ACTION

Information Disclosure Statement

The information disclosure statement filed on July 9, 2002 fails to comply with 37 CFR 1.98(a)(3) because it does not include a concise explanation of the relevance, as it is presently understood by the individual designated in 37 CFR 1.56(c) most knowledgeable about the content of the information, of each patent listed that is not in the English language (DE 43 01 477). It has been placed in the application file, but the Foreign Patent DE 43 01 477 referred to therein has not been considered.

Drawings

The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they do not include the following reference sign(s) mentioned in the description: "w" (page 16 line 19), "W" (page 16 line 20), "200" (page 19 line 7, "80" (page 21 line 18), and "355" (page 21 line 19). A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference sign(s) not mentioned in the description: Figure 6 reference 520, Figure 8B reference 225', Figure 12 reference 90, Figure 13 reference 90, Figure 15 reference 385, Figure 16 reference K, Figure 19 reference 360, Figure 22C reference 620, and Figure 24B reference P". A proposed drawing correction, corrected drawings, or amendment to the specification to add the reference sign(s) in the description, are required in reply to the Office

action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Specification

The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

The disclosure is objected to because of the following informalities:

The phrase “effective magnifications of 13X, 15X, and 19X for blue, green, and red light, respectively” (page 20 line 3) is unclear because Figure 7 shows 13X, 15X, and 17X for blue, green, and red light, respectively. Suggested correction: replace the phrase “19X” with “17X”.

The sentence “Microimage 365 is carried on a transparent substrate 380, and microimage 375 is carried on an adjacent transparent substrate 380.” (page 22 lines 7 and 8) is unclear because reference 380 is used to refer to two different transparent substrates. Suggest correction: based on Figure 15, replace the phrase “an adjacent transparent substrate 380” with “an adjacent transparent substrate 385”.

The sentence beginning “For example, FIG. 24A” (page 32 lines 5 and 6) is unclear because the referred to imaging lens 700 is shown in Figure 23A. Suggested correction: replace the phrase “FIG. 24A” with “FIG. 23A”.

The sentence beginning “FIG 24B shows a point P” (page 32 lines 6 – 8) is unclear because the referred to conjugate finite point P’ is shown in Figure 23B. Suggested correction: replace the phrase “FIG. 24B” with “FIG. 23B”.

Appropriate correction is required.

Claim Objections

Claims 10, 11, 22, and 23 are objected to because of the following informalities: the limitation “a spatial resolution at increasing at peripheral angular locations” (Claim 10 lines 3 and 4, and Claim 22 lines 3 and 4) is unclear because the word “at” is repeated. Suggested correction: delete one occurrence of the word “at” in this limitation. Appropriate correction is required.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1 – 5 and 7 – 11 are rejected under 35 U.S.C. 102(b) as being anticipated by Morton.

Regarding claim 1, Morton teaches a lens array (Figure 1 reference 16) comprising an array of lens elements (reference 14) having a backplane (reference 15) for reproducing an image (reference 10) located at the backplane, each lens having a nonunitary magnification and reproducing visual information from the backplane to a finite conjugate region in free space (column 3 lines 19 – 30) such that the reproduced visual information overlaps with visual information reproduced in free space by at least one neighboring lens element (column 3 lines 23 – 26).

Regarding claim 2, Morton teaches the visual information is reproduced by the lens elements as a stereoscopic image (column 3 lines 45 – 51).

Regarding claim 3, Morton teaches the lens array further comprising a source of visual information on the backplane, the visual information comprising pixels (reference 12) each constituting a discrete component of visual information, each lens element producing an aerial image comprising multiple pixels simultaneously viewable at the conjugate region (column 3 lines 21 – 30).

Regarding claim 4, Morton teaches the visual information produced in free space varies with a viewing angle (column 3 lines 26 – 27), the lens elements having lens pitch (Figure 6 reference W) defining center-to-center distances there between and cooperating to reproduce an image having a spatial resolution (reference Wd) distinct from the lens pitch.

Regarding claim 5, Morton teaches the lens elements cooperate to reproduce an image having a spatial resolution greater than the lens pitch (Figure 6, $Wd > W$).

Regarding claim 7, Morton teaches the lens elements cooperate to project a finite conjugate field to a series (Figure 1 references 20 – 30) of inherently curved quadratic surfaces in free space. As illustrated by Hecht, the conjugate field produced by a lens is inherently curved (Figure 6.25). This curvature is the Petzval field curvature, which is quadratic by definition (Equation 6.43).

Regarding claim 8, Morton teaches the quadratic surfaces produced by each of the lens elements intersect, forming a mosaic virtual field having locally varying spatial and angular resolutions (Figure 6).

Regarding claim 9, Morton teaches the lens elements inherently have a residual field curvature (as described above as Petzval field curvature) so as to vary locally in magnification,

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the mosaic virtual field and varied magnification facilitating visual decorrelation of images individually produced by the lens elements (column 9 lines 9 – 44).

Regarding claim 10, Morton teaches the lens elements inherently have a residual field curvature (as described above as Petzval field curvature) so as to vary locally in magnification, the lenses providing an angular resolution increasing toward a center of a viewing field and a spatial resolution increasing at peripheral angular locations (Figure 6).

Regarding claim 11, Morton teaches a degree of visual-information overlap determines a rate at which spatial resolution decreases with distance from the center of the viewing field (column 9 lines 9 – 44).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 6 and 12 – 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Morton.

Regarding claims 6, 12, and 18, Morton discloses the claimed invention as described above except for the lens elements have magnifications ranging from 1:8 to 1:100. It would have been obvious to one having ordinary skill in the art at the time the invention was made to select a magnification of the lens elements within the range of 1:8 to 1:100, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. One would have been motivated to select a

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magnification of the lens elements for the purpose of determining the size of the image produced by the lens elements.

Regarding claim 13, Morton inherently teaches the step of varying a distance between the visual information and the backplane to vary the magnification. As illustrated by Hecht, the magnification caused by a lens is inherently dependant on the distance of the visual information and the lens (Figure 5.26).

Regarding claim 14, Morton teaches the visual information is reproduced by the lens elements as a stereoscopic image (column 3 lines 45 – 51).

Regarding claim 15, Morton teaches the lens array further comprising a source of visual information on the backplane, the visual information comprising pixels (reference 12) each constituting a discrete component of visual information, each lens element producing an aerial image comprising multiple pixels simultaneously viewable at the conjugate region (column 3 lines 21 – 30).

Regarding claim 16, Morton teaches the visual information produced in free space varies with a viewing angle (column 3 lines 26 – 27), the lens elements having lens pitch (Figure 6 reference W) defining center-to-center distances there between and cooperating to reproduce an image having a spatial resolution (reference Wd) distinct from the lens pitch.

Regarding claim 17, Morton teaches the lens elements cooperate to reproduce an image having a spatial resolution greater than the lens pitch (Figure 6, $W_d > W$).

Regarding claim 19, Morton teaches the lens elements cooperate to project a finite conjugate field to a series (Figure 1 references 20 – 30) of inherently curved quadratic surfaces in free space. As illustrated by Hecht, the conjugate field produced by a lens is inherently curved

(Figure 6.25). This curvature is the Petzval field curvature, which is quadratic by definition (Equation 6.43).

Regarding claim 20, Morton teaches the quadratic surfaces produced by each of the lens elements intersect, forming a mosaic virtual field having locally varying spatial and angular resolutions (Figure 6).

Regarding claim 21, Morton teaches the lens elements inherently have a residual field curvature (as described above as Petzval field curvature) so as to vary locally in magnification, the mosaic virtual field and varied magnification facilitating visual decorrelation of images individually produced by the lens elements (column 9 lines 9 – 44).

Regarding claim 22, Morton teaches the lens elements inherently have a residual field curvature (as described above as Petzval field curvature) so as to vary locally in magnification, the lenses providing an angular resolution increasing toward a center of a viewing field and a spatial resolution increasing at peripheral angular locations (Figure 6).

Regarding claim 23, Morton teaches a degree of visual-information overlap determines a rate at which spatial resolution decreases with distance from the center of the viewing field (column 9 lines 9 – 44).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Denise S Allen whose telephone number is (703) 305-7407. The examiner can normally be reached on Monday - Friday, 8:30am - 5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Cassandra Spyrou can be reached on (703) 308-1687. The fax phone numbers for the

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organization where this application or proceeding is assigned are (703) 872-9318 for regular communications and (703) 872-9319 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-1782.

Denise S Allen
Examiner
Art Unit 2872



dsa

March 9, 2003



MARK A. ROBINSON
PRIMARY EXAMINER